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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/840,082	04/24/2001	Joo Soo Lim	049128-5006	2174

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EXAMINER
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QI, ZHI QIANG

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 11/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/840,082

Applicant(s)

LIM ET AL.

Examiner

Mike Qi

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4/19/02.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**2. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant admitted prior art (AAPA) in view of US 6,297,862 (Murade).**

Claims 1, 5, 9, 11, 15 and 19, AAPA discloses (the specification of page 2, paragraph 0003 – page 4, paragraph 0008; Figs. 1-3) a liquid crystal display comprising:

(concerning claims 1 and 11)

- a pixel electrode (10) at a pixel area between a gate line (14) and data line (13);
- a switching device (thin film transistor TFT) (12) at an intersection between the gate line (14) and the data line (13);
- a light-shielding member (black matrix) (11) overlapping the switching device (TFT) (12);

(concerning claims 5 and 15)

- a charging device (a storage capacitor between the gate line 14 as the lower electrode and the upper metal thin film 15 as the upper electrode) on the gate line (14);

- a light-shielding member (black matrix) (11) overlapping the switching device (TFT) (12);
- a light-shielding member (black matrix) (11) overlapping the charging device (the storage capacitor);

(concerning claims 1, 9 and 19)

- a light-shielding member (black matrix) (11) on a front substrate (2) opposed to the rear substrate (1), and at a boundary portion between pixel areas (10);
- a light-shielding member (black matrix) (11) for blocking light incident onto the drain electrode (the thin metal film) (7) of the switching device (TFT) (12) and for blocking light incident onto the storage capacitor upper electrode (a metal film) (15).

AAPA does not expressly disclose the light-shielding member (black matrix) extending from an end at the pixel electrode side of a drain electrode (metal thin film) of the TFT (the extending portion would be a dummy black matrix) and extending from an end at the pixel electrode side of the storage capacitor upper electrode (metal thin film) (the extending portion would be a dummy black matrix) into the pixel area, and the light-shielding member (black matrix) covering and extending past all sides of the drain electrode (metal thin film) with a margin sufficient to block light incident on the metal thin film.

However, Murade discloses (col.7, line 11 – col.9, line 67; col.16, line 43 – col.17, line 53; Figs.1, 2, 11-14, 20) that the shielding film (black matrix 6) is formed around the pixel, and the shielding film (black matrix 6) covering the switching device

(TFT, such as the source/drain regions 1a and 1b) and extending from the drain region into the pixel area, and the light shielding member (black matrix 6) covering and extending over the drain/source region, so that is sufficient to block light incident onto the drain/source region (the metal thin film), and the light incident on the liquid crystal device does not affect the TFT performance, and a bright, high quality images will be ensured. Murade also indicates (col.16, line 43 – col.17, line 53) that the capacitance line (16) must be shielded from light, it is necessary for a black matrix placed on an opposed substrate (31) to have a sufficiently large area, so that the adverse effect due to incident light will be negligible, and this arrangement minimizes the leakage current.

Since such light-shielding arrangement would sufficiently block the light incident to the TFT, so as to minimize the leakage current of the TFT, such that the device can present a display of high quality images free from image degrading effect such as cross-talk.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to extend the light-shielding film covering the drain electrode and covering the storage capacitor upper electrode from an end of the pixel electrode side, i.e., a light-shielding member (black matrix) covering and extending the drain electrode (metal thin film) and covering the capacitance line (charging device) with a margin sufficiently blocking light incident onto the drain electrode as claimed in claims 1, 5, 9, 11, 15 and 19 for minimizing the leakage current of the TFT, improving the display contrast, and presenting a display of high quality images free from image degrading effect such as cross-talk.

Claims 2, 6, 12 and 16, AAPA discloses (the specification of page 2, paragraph 0003 – page 4, paragraph 0008; Figs. 1-3) that the light-shielding member (11) is at a front substrate (2) opposed to a rear substrate (1) which includes the switching device (TFT 12), pixel electrode (10), the charging device (storage capacitor), and a liquid crystal layer between the two substrate.

Claims 3, 7, 13 and 17, AAPA discloses (the specification of page 2, paragraph 0003 – page 4, paragraph 0008; Figs. 1-3) that the light-shielding member is a black matrix.

Claims 4 and 14, AAPA discloses (the specification of page 2, paragraph 0003 – page 4, paragraph 0008; Figs. 1-3) that the switching device is a thin film transistor (TFT 12) at the intersection between the gate line (14) and the data line 913) for driving the pixel electrode (10), and the drain electrode made of metal is connected to the pixel electrode (10) via contact hole (9).

Claim 8, AAPA discloses (the specification of page 2, paragraph 0003 – page 4, paragraph 0008; Figs. 1-3) that the charging device is a storage capacitor including an upper electrode (15) formed with the gate line (14) wherein a dielectric layer (gate insulating layer 4) is at between the upper electrode (15) and the gate line (14), and the upper electrode made of metal.

Claims 10 and 20, AAPA discloses (the specification of page 2, paragraph 0003 – page 4, paragraph 0008; Figs. 1-3) that the drain electrode (7) is connected to the pixel electrode (10) via contact hole (9), and the storage capacitor upper electrode (15)

is at between the gate line (14) and a dielectric layer (passivation layer 8); and all the electrode must be made of metal as the electrical conductivity.

Claim 18, AAPA discloses (the specification of page 2, paragraph 0003 – page 4, paragraph 0008; Figs. 1-3) that the storage capacitor upper electrode (15) made of metal over the gate line (14) and a dielectric layer (gate insulating layer 4).

**3. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA and Murade as applied to claims 1-20 above, and further in view of US 6,266,117 (Yanagawa et al).**

Claim 21, concerning the material of the light-shielding member is formed with an organic material containing a black pigment, that was common and known in the art as the light shielding property of the organic material containing a black pigment. Yanagawa discloses (co.7, lines 1-2) that the light shielding film is made of an organic resin in which, e.g., black pigment is dispersed, so that using the organic resin containing a black pigment as a light shielding member would be a routine skill in the art.

Therefore, it would have been obvious to those skilled in the art to use an organic material containing a black pigment as a light shielding member as claimed in claim 21 for shielding light because the organic material containing a black pigment having the property to absorb light.

***Response to Arguments***

4. Applicant's arguments filed on Apr.16, 2003 have been fully considered but they are not persuasive.

Applicant's **only** arguments are as follows:

1) The reference Sasuga does not disclose or suggest that the light-shielding layer (BM) covering and extending past all sides of the metal thin film with a margin sufficient to block light incident on the metal film.

2) Non of the references teaches or suggests that a light-shielding member overlapping the charging device and extending from an end at the pixel electrode side of the metal thin film into the pixel area with a margin sufficient to block light incident on the metal thin film.

Examiner's responses to Applicant's **only** arguments are as follows:

1) The reference Sasuga discloses (col.9, line 31 – col.10, line 12, Figs.1, 2, 7 and 19) that the shielding film (BM) is formed around the pixel, and the shielding film (BM) at the peripheral portion is extended to the outside of the seal portion (SL) as shown in Figs. 17 to 20, so as to prevent the leakage light. Such that the shielding film (BM) is extended from the end of the pixel electrode side of a drain electrode (SD1/SD2) as shown in Fig.2 (the TFT electrode is covered by the black matrix BM, see the Fig.2, and the black matrix BM is not vertical aligned with the edge of the electrode SD1 and SD2, the black matrix BM covers the electrodes SD1 and SD2.) and the shielding film (BM) is extended from the end of the pixel electrode side of a storage



capacitor (Cadd) upper electrode as shown in Figs.1-3 into the pixel area, as a result, the contour of each pixel is clarified to improve the contrast by the shielding film (BM).

The prior art of record shows a light shielding film covering the TFT region, such as the reference Murade as the explanation above.

2) The reference Murade also indicates (col.16, line 43 – col.17, line 53) that the capacitance line (16) (charging device) must be shielded from light, and it is necessary for a black matrix placed on an opposed substrate (31) to have a sufficiently large area, so that the adverse effect due to incident light will be negligible, and this arrangement minimizes the leakage current.


### ***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (703) 308-6213.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Mike Qi  
October 30, 2003

  
TOANTON  
PRIMARY EXAMINER